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< Desc/ Clms PAGE NUMBER 1 >

### Description

Multilayer laser transfer foil for durable marking of components

The invention relates to a multilayer laser transfer foil to the durable Beschriftung from components from at least a carrier layer, whereby is at least partial present on the lower side of the carrier layer a first adhesive layer, on which at least two pigment layers applied are.

To the identification of components at vehicles, machines, electrical and electrical niches apparatuses find among other things technical labels use, thus as type describe, as tax labels for process flows as well as Garantie- und Prüfplaketten.

The identification by means of laser labels and more printed or more painted metal-describe possesses straight in the automobile industry, in particular for high-quality markings, an increased value. In this way informations and references become placed such as tire pressure or kind of fuel for the later user on most diverse components of the automobile. Also in the upstream Fertigungsstufen important production data can become over a laser label transported.

For this application the label with a bar code can be marked. By a suitable reader an assembly team receives the possibility, to direct at the manufacturing road informations over model, color and special equipment by the bar code out zulesen.

In addition, apart from these standard information sensitive safety data become such as Fahrgestell- und identification numbers by labels at the vehicle placed. In case of

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from theft or accident these informations for a backtracing of vehicle and Fertigungsstufen are of great importance.

The inserted label material must in order to work against manipulation attempts, be as falsification safe as possible. It may not become detached non destructive of the Verklebungsgut.

Additional security becomes achieved over the high brittleness of the material in combination with high adhesive forces. The adhesive force of the material on the clamping coat plays a large role. It is decisive for the resistance against a manipulation attempt by peelings.

Beside the standard material there are modified labels, which are to make an imitation of the material impossible by other safety features such as embossments, holograms or a permanent UV impression (footprint).

Powerful controllable lasers for burning markings such as writings, codes and such a thing are common. To the one which can be marked and/or the material inserted to the label the among other things subsequent requirements become provided:

It should be beschriftbar quick.

It is to become an high spatial resolving power achieved.

It should be in the application as simple ones as possible.

The decomposition products are not to work corrosive.

Beyond that additional characteristic characteristics become required for particular cases: By means of Belassung manufactured indicia it should be so high-contrast that they can be read also bottom unfavorable conditions over far removals correct.

High temperature resistance should be given, for example to over 200 C.

Good resistance against weathering, water and solvent is desired.

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With the use of flat, sharp blades succeed in separating labels complete from the substrate. Particularly on plastic undergrounds such as polyethylene or polypropylene the composite shows between sticking mass and ground weakness.

Despite an elevated adhesive force on metallic or painted substrates it is also there possible to replace by use of special tools a part of the labels without Zerstörung. A special blade tool can do that in a flat angle bottom Label guided become. By careful cut movements it is possible, one

To raise edge, whereby a Anfasser so mentioned develops. In this way generated one a point of attack, a peeling the

simplified.

Labels exhibit thus a disadvantage in principle.

Case the labels not with a laser label on the component applied will separate the easy possibility by means of imprint, exist for third the label abzu to wash or abzurubbeln. Also simple rubbing of the marked article against a second subject-matter, for the example of a packaging, around the single letters or digits is often enough to weak.

Object of this invention is it to be created a multilayer laser transfer foil those the quick and precise marking of arbitrary components possible, which become fair the requirement the mentioned of of the improved falsification safeness, which is not more releasable even non destructive with the help of a cutting tool, further in particular high contrast, high resolving power, high temperature resistance and in subject application possibilities exhibit.

Dissolved one becomes this object by a multilayer laser transfer foil, as it is described in accordance with principal claim. Subject-matter of the Unteransprüche are advantage particularly cling to embodiments of the invention article as well as uses of the same.

Accordingly the invention concerns a multilayer laser transfer foil for durable marking of components from at least a carrier layer, whereby on the side of the carrier layer of the laser transfer foil, on that itself the first adhesive layer attachment in December, at least two a laser-sensitive pigment contained pigment layers to in

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dest partial present are and whereby the concentrations of the laser-sensitive pigment in the pigment layers different are.

Preferably it concerns two pigment layers, whereby in particular the Kon mentschicht zentration the laser-sensitive pigment in first, the carrier layer closer Pig is smaller than the concentration of the laser-sensitive pigment in second Pigment layer.

It more other preferably concerns three pigment layers, whereby in particular those

Concentration of the laser-sensitive pigment in first, the carrier layer closer

Pigment layer is smaller than the concentration of the laser-sensitive pigment in the second pigment layer, which is again smaller than the concentration of the leaving siblen pigment in the outside pigment layer.

In other favourable embodiments with more than three pigment layers preferred becomes, if with the increase of the removal of the single pigment layer of the carrier layer the concentration of the laser-sensitive pigment in the respective pigment layer increases.

In a particularly excellent embodiment the concentration of the laser-sensitive laser-sensitive pigment in first, the carrier layer next pigment layer between 0,25 thread. - % to 0.75 thread. - %, in particular 0.5 thread. - %, the concentration of the laser-sensitive pigment in the second pigment layer between 0,75 thread. - % to 1.25 thread. - %, in particular 1 thread. - %, as well as the concentration of the laser-sensitive pigment in the third pigment layer between 1,5 thread. - % to 2.5 thread. - %, in particular 2 thread. - amounts to %.

⌘ top The pigment layers beside the laser-sensitive Pigmen more other preferably contain ten a glass river pigment and an absorber.

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The adhesive will preferred full laminar on the carrier layer applied, can however depending upon application also partial coated become. If the first pigment layer becomes applied, then this can be to the one in the direct contact with the carrier layer, rest upon on the other hand in addition, the first adhesive layer, independent of it whether the first pigment layer is likewise partial applied.

Comparable one applies to the second pigment layer as well as all if necessary subsequent

Pigment layers. Second and the other pigment layers become in each case on those before applied layers coated, partial or full depending upon application laminar. Depending upon kind of the job as well as the distribution underlying of in each case

Layers result most different variations in the setup of the laser transfer foil.

Preferably the backbone that consists the laser-sensitive pigment contained layers likewise of the adhesive of the first adhesive layer, so that the first sticking layer and the pigment layers forms a single homogeneous layer. Only in the marginal area of the homogeneous layer, on that the carrier layer of opposite side, the laser-sensitive pigments in varying concentration are distributed in one in particular comparatively narrow region of the homogeneous layer. Two or several barrier layers form accordingly.

In order to improve the adhesion properties of the multilayer laser transfer foil on the component which can be marked more other, a second adhesive layer is preferably on those the laser-sensitive pigment contained second and/or third pigment layer applied.

In particular the second adhesive layer can be in the form of Dots or in the screen printing up brought, if necessary also as wing tip edge printing, so that the transfer foil in arbitrary way on the ground can become bonded.

Preferably the thickness of the individual layers becomes selected from the subsequent Berei chen: Carrier layer (preferred PET) 12 around to 240 over, particularly 100 over to 200 over

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Adhesive (preferred acrylate) 5, around to 45 over, particularly 25 pm to 35 around first pigment layer 1 around to 10 over, particularly 2 around to 5 pm second pigment layer 1 around to 10 over, particularly 2 around to 5 around third pigment layer 1 around to 10 over, particularly 2 around to 5 around the films, which are to find according to invention as

carrier material use, transparent and/or translucent should be, at least must them in such a manner designed be that an absorption of the laser beam, which would lead to a destruction the same is out closed.

In particular it is desirable, if the carrier material within the waving of prolonged range from 530 to 1064 Nm no light absorbed.

As carrier material preferably films can be begun, which are in an other excellent designed variant of the invention transparent, in special monoaxial and biaxial stretched films on basis of polyolefins, then films on basis of stretched polyethylene or stretched copolymers, according to invention contained ethyl and/or polypropylene units, if necessary also PVC films, films on basis of vinyl polymers, polyamides, polyester, polyacetals, polycarbonates.

In particular pet films are excellent suitable as carriers.

Also films on basis of stretched polyethylene or stretched copolymers, enthal tend Etylen-und/or polypropylene units, can be begun as carrier film in accordance with invention.

Monoaxial stretched polypropylene is characterised by its very high tear resistance and small elongation in longitudinal direction. Preferred labels in accordance with-eaten to the production the invention is monoaxial stretched films on basis of polypropylenes.

Particularly preferred for the laser transfer foils according to invention is einschichtige, biaxial or monoaxial stretched films and multilayer, biaxial or monoaxial films on basis of polypropylenes, which exhibit a sufficient fixed composite between the layers, since a Delaminieren of the layers is adverse during the application.

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Films on basis of hard PVC become the production of laser transfer foils just as used as films on basis of soft PVC.

For the laser transfer foils according to invention films become preferably used on basis of hard PVC.

Films on polyester basis, for the example polyethylene terephthalate are likewise known and can likewise the production of the transfer foils according to invention inserted become.

Polyesters are polymers, whose basic modules by ester connections (- CO-O) to be held together. According to its chemical setup the so called Homopolyester can be divided in two groups, 'the hydroxy acid types (off polyesters) and 'the Dihydroxy dicarbonic acid types (MBB polyesters)...

First become from only a single monomer through the example polycondensation one hydroxycarboxylic acid 1 or 2 manufactured by ring opening polymerization of cyclic esters (lactones), the example

EMI 7.1

The setup latter made Monomerer, for the example a diol 3 and a dicarbonic acid 4, complementary against it by polycondensation of two:

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EMI 8.1

Branched and crosslinked polyesters become obtained with the polycondensation of three or polyvalent alcohols with polyfunctional carbonic acids. The polyesters general become also the polycarbonates (polyesters of the carbonic acid) calculated.

Abbott YP polyesters (I) are and. A. Polyglycolic acids (Polyglykolide, R = CH<sub>2</sub>), Polymilch acidic (polylactides, R = CH-CH<sub>3</sub>), Polyhydroxybuttersäure [Poly (3-hydroxybuttersäure), R = CH (CH<sub>3</sub>) - CH<sub>2</sub>], Poly (s-caprolacton) e [R = (CH<sub>2</sub>) 5] and Polyhydroxybenzoesäuren (R = C<sub>6</sub>H<sub>4</sub>).

Pure aliphatic AA-BB-TYPE-polyesters (II) are polycondensates from aliphatic diols and dicarbonic acids, those and. A. as products with terminal hydroxy groups (as Polydiol) for the production of polyester PU inserted become [to the with play Polytetramethylenadipat; G 1 = R<sub>2</sub> = (CH<sub>2</sub>) 4].

AA-BB-TYPE-polyesters from aliphatic diols and aromatic dicarboxylic acids, in particular the Polyalkylenterephthalate [R<sub>2</sub> = C<sub>6</sub>H<sub>4</sub>, have quantitatively largest technical importance with polyethylene terephthalate (PET) g 1 = (CH<sub>2</sub>) 2, Polybutylentere phthalat (PBT) g 1 = (CH<sub>2</sub>) 4 and Poly (1, 4-cyclohexandimethylenterephthalat) e (PCDT) g 1 = CH<sub>2</sub>-C<sub>6</sub>H<sub>10</sub>-CH<sub>2</sub>] as most important members. These types of polyester can by Mitverwenden of other aromatic dicarboxylic acids (for the example isophthalic acid) and/or by use of Diol mixtures with the polycondensation in their properties wide varied and different application fields adapted become.

Pure aromatic polyester are the polyarylates, to those and. A. the Poly (4-hydroxybenzoesäure) (formula I, R = C<sub>6</sub>H<sub>4</sub>), polycondensates from bisphenol A and phthalic acids (formula 11, g 1 = C<sub>6</sub>H<sub>4</sub>-C (CH<sub>3</sub>) 2-C<sub>6</sub>H<sub>4</sub>, R<sub>2</sub> = C<sub>6</sub>H<sub>4</sub>) or also such from bisphenols and phosgene belong.

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The adhesive of the first and second adhesive layer of the laser according to invention transfer foils knows a self adhesive mass on basis of natural rubber, PURE, Acryla ten or styrene isoprene styreneBlockcolymere to be.

The use of adhesives on basis of natural rubber, acrylates or styrene Isopren Stryrol is known, which also for the example in the " Handbook OF pressure sensitive adhesive technology, second edition, edited by Donatas Satas, Van Nostrand Reinhold, New York, 1989 described becomes.

As self adhesive mass comes a commercial pressure-sensitive in particular

Sticking mass on PURE, acrylate or india rubber basis to the use.

As adhesive such on Acrylathotmelt basis, which exhibits a K value of at least 20, in particular large 30, available particularly favourably proved such measures by Aufkonzentrieren of a solution to a system processable as Hotmelt.

The Aufkonzentrieren can take place in corresponding equipped kettles or extruders, in particular at the degassed one exerted by it is a degassing extrusion preferred.

A such adhesive is in the DE 43 13 008 A1 stated, on whose content hereby respect taken will and whose content becomes part of this disclosure and invention. In an intermediate step the solvent complete is extracted from these in this way manufactured acrylate masses.

Additional ones become thereby other volatile constituents remote. After the coating from the melt these masses exhibit only minor proportions at volatile components. Thus all know monomers/prescriptions in the writing stated above stressed to be taken over. An other advantage of the described masses is to be seen in the fact that these exhibit an high K value and thus an high molecular weight. The expert is known that systems with higher molecular weights can be interlaced more efficiently. Thus the corresponding portion of volatile components sinks.

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The solution of the mass can do 5 to 80 thread. - %, in particular 30 to 70 Gew. - % Solvents contain.

Preferably commercial solvents become inserted, in particular low simmering hydrocarbons, Ketone, alcohols and/or esters.

A snail, Zweischnellen or more other preferably become multi-snail ex more truder with one or in particular two or several degassing units inserted.

In the adhesive on Acrylathotmelt basis Benzoinderivate in-polymerized can be, so for example Benzoinacrylat or Benzoinmethacrylat, acrylic acid or Methacrylic ester. Such Benzoinderivate is into the EP 0,578,151 A1 beschrie users.

In addition, the adhesive on Acrylathotmelt basis can be chemical crosslinked.

In one preferable embodiment particularly become as self adhesive masses copolymers from (Meth) acrylic acid and their esters with 1 to 25 C-atoms, mark in, Fumar and/or itaconic acid and/or their esters, substituted (Meth) acrylamides, maleic anhydride and other vinyl compounds, like vinyl esters, in particular vinyl acetate, vinyl alcohols and/or vinyl ethers inserted.

That remainder solvent content should bottom 1 thread. - % amount to.

An adhesive, which shows up as particularly suitable, is a low molecular Acrylatschmelzhaftklebemasse, like it the bottom designation acResin UV or Acronal (g), in particular Acronal DS 3458, becomes guided of which BASF. This adhesive with nied rigem K value receives its practical properties by a final radiation chemistry released crosslinking.

Further an adhesive can become used, which from the group of the nature chewing tschuke or the synthesis india rubbers or from any dazzle out nature chewing tschukun and/or synthesis india rubbers exists, whereby the natural rubber or the natural rubbers in principle from all available qualities as for the example Crepe, RSS, ADS, TSR or CV-types, depending upon required Reinheits-und viscosity level, and the synthetic rubber or the synthesis india rubbers from the group of the random copolymerisierten styrene butadiene rubbers (SBR), the butadiene rubbers (BR), that

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synthetic polyisoprenes (IR), the butyl rubber (IIR), halogenated Butyl chewing tschuke (XIIIR), the acrylate india rubbers (ACM), which Etylen vinyl acetatecopolymers (EH) and the polyurethanes and/or their Blends selected to become to be able.

Further preferably can the rubbers to the improvement of the processability thermoplastic elastomers with a proportion by weight from 10 to 50 thread. - % added become, related to the entire elastomeric portion.

On behalf mentioned is in this place above all the particularly compatible Styrol isoprenestyrene (SIS) - and styrene butadiene styrene (SBS) - types.

As tacky resins are without exception all previously known and adhesive resin described in the literature more insertable. Mentioned ones are on behalf the rosin of resins, whose disproportionierte, hydrogenated, polymerized, esterified derivatives and salts, the aliphatic and aromatic hydrocarbon resins, terpene resins and terpen of phenolic resins. Arbitrary combinations of these and other resins can become inserted, in order to adjust the properties of the resultant sticking mass as desired.

On the representation of the knowledge conditions in the " Handbook OF Pressure sensitive Adhesive Technology " of Donatas Satas (van Nostrand, 1989) is expressly referred to.

Hydrocarbon resin is a collective term for thermoplastic, colorless to intensive brown colored polymers with a molecular weight of generally < 2000.

They can be divided according to their provenance into three large groups: In petroleum, Kohlenteer-und of terpene resins. The most important coal tar resins are the Cumaron Inden of resins. The hydrocarbon resins become recovered by polymerization of the unsaturated compounds isolatable from the raw materials.

Hydrocarbon resins become also by polymerization of monomers such as styrene and/or by polycondensations (certain formaldehyde resins) accessible polymers with corresponding low molecular weight calculated. Coal water of material resins are products with within wide limits of < 0 C (with 20 C liquid charring of hydrogen resins) to > 200 C varying softening range and a density of approx. 0,9 to 1, 2 g/cm<sup>3</sup>.

They are soluble in organic solvents such as ethers, esters, Ketonen and chlorinating ten hydrocarbons, insoluble in alcohols and waters.

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Bottom rosin resins becomes a natural resin understood, that from the raw resin of Koniferen recovered becomes. One differentiates between three rosin types: Balsam resin as Distillation residue of turpentine oil, root resin as extract of Koniferen root sticks and Tallharz, the distillation residue of tall oil. The quantitatively largest Importance has balsam resin.

Rosin is a brittle, transparent product from redder to brown color. It is water-insoluble, soluble against it in many organic solvents like (chlorinated) aliphatic and aromatic hydrocarbons, esters, ethers and Ketonen as well as in vegetable and inorganic oils. The softening point of rosin lies in Area of approx. 70 to 80 C.

Rosin is a mixture out approx. 90% resinic acids and 10% neutral cloths (fat acidic esters, Terpenalkohole and hydrocarbons). The most important rosin resinic acids is unsaturated carbonic acids of the gross formula  $C_{20}H_{30}O_2$ , Abietin, Neo abietin, Lävopimar, Pimar, Isopimar, and Palustrinsäure, beside hydrogenated and dehydrated abietic acid.

The amount ratios of this acidic ones vary in dependence of the provenance of the rosin.

As softeners all known softening substances know inserted who that. In addition among other things the paraffinischen and naphthenischen oils count, (funktiona lisierte) oligomers such as Oligobutadiene, - isoprene, liquid nitrile rubbers, liquid Ter penharze, vegetable and animal oils and greases, phthalates, functionalised acrylates.

To purposes of the thermal induced chemical crosslinking are more insertable all previously known thermal activatable chemical crosslinkers like accelerated sulfur or sulfur donor systems, isocyanate systems, reactive Melamin, Formaldehyd- und (of optional halogenated) phenol formaldehyde resins and/or reactive phenol resin or Diisocyanatvernetzungssysteme with the corresponding activators, epoxi dierte Polyester- und of acrylate resins as well as their combinations.

The crosslinkers become preferably activated with temperatures over 50 C, in particular with temperatures from 100 C to 160 C, whole particularly preferred with temperatures from 110 C to 140 C.

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The thermal excitation of the crosslinkers can take place also via IR rays or hochenergeti sche alternating fields.

The adhesives, which are to find use according to invention, should be transparent and/or translucent, at least must them in such a manner designed be that a Absorp is tion the laser beam, which would lead to a destruction the same precluded.

In particular it is desirable, if the adhesive within the wavelength of range from 530 to 1064 Nm no light absorbed.

The first pigment layer in particular with glass river pigment and absorber as well as the laser-sensitive pigment preferably in form of a solvent suspension, for the example of an isopropanol suspension, on the first adhesive layer applied, in particular in a thickness of 2 over to 5 over.

The second pigment layer in particular with glass river pigment and absorber as well as the laser-sensitive pigment becomes likewise preferably in form of a solvent suspension, applied for the example of an isopropanol suspension, on the first pigment layer, in particular in a thickness of 2 over to 5 over.

The third pigment layer also in particular with glass river pigment and absorber as well as the laser-sensitive pigment becomes likewise preferably in form of solvent US pension, for the example of an isopropanol suspension, on the first pigment layer up carried, in particular in a thickness of 2 over to 5 over.

With laser-sensitive pigments pigments should be meant here, which show bottom laser irradiation a color change.

Suitable laser-sensitive additives are in particular colored pigments and metal salts. In special finds pigments of the company TherMark application, for the example the TherMark of pigments @ to 120-30 F (black), with those it around metal oxides, for the example Molyb there tri oxide acts. The other mixtures of several pigments or Abmi can do schungen of pigments with glass river pigments, how they are at the company Merck available, inserted to become, which can lead to a sintering process.

The additive knows additional to the preferred absorber titanium dioxide used who that.

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In particular these additives become the suspension the formation of the layer (as for the example in DE G 81 30 861 described) in the order of magnitude from some parts per thousand to maximum 10 thread. - %, preferred in amounts from 0,1 to 10 thread. - %, in particular from 0,5 to 6 thread. - % related to the total weight of the layer, admixed, whole particularly favourable-proves in concentrations of 0,5 thread. - %, 1 Gew. - %, 2,5 thread. - % and 4 Gew. - %.

Further Merck (for example the Perl gloss pigments EM 143220 and BR 3-01) are excellent suitable as laser-sensitive various pigments of the company.

As glass river pigment and absorbers preferably inserted silicon dioxide or mixtures becomes such as  $BaO-CaO-SiO_2$ .

The subsequent particle size distribution of the glass river pigments is recommended for one erfin would dung-in accordance with-eat laser transfer foil:

EMI 14.1

< tb> Type < September> Description < September> Middle < September> Particle size  
< tb>

<tb> [, <September> over]

<tb>

<tb> SM <SEPTEMBER> Narrow <September> Distribution <September> 2,5-3, <September> 5

<tb>

<tb> UF <SEPTEMBER> Dental powder, <September> also <September> silanisiert <September> 0,7-1, <September> 5

<tb>

The subsequent distributions are possible, become however not preferred inserted:

EMI 14.2

<tb> Type <September> Description <September> Middle <September> Particle size

<tb>

<tb> [pm]

<tb>

<tb> K <SEPTEMBER> Standard <September> 3, <September> 0-30,0

<tb>

<tb> FIBER PLASTIC <SEPTEMBER> High <September> Powder purity <September> 1, <September> 0-3,5

<tb>

<tb> SIGN <SEPTEMBER> Wide <September> Distribution <September> 4, <September> 0-10,0

<tb>

One knows glass powders, how they are stated above, for the example of the company Schott refer.

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In the case of use of the standard lasers, the special widespread Ip-YAG-solid state lasers with a wavelength of 1,06 pm, the laser beam penetrates through the carrier layer and those

Adhesive layer and meets the absorber in the pigment layers the glass river pigment, as well as the laser-sensitive pigment.

It made during the laser inscription the desired junction of the metal oxide on the ground which can be marked, whereby the simultaneous metal oxide with a glass becomes layer coated.

It comes to a sintering process, during which the laser-sensitive pigment on the under becomes reason of transfered and is received a durable and stable composite with the substrate.

Sharp, high-contrast labels and identifications obtained become.

For the job of the adhesive on the carrier material as well as for the job that at least two pigment layers are suitable the known direct and indirect Auftragsverfahren.

Mentioned ones are the Accugravur, the blade, the roll blade, the RCC, the Super Reco, the RAM method, the other use of a Lüftbürste and a casting method, then screen printing methods.

Acrylathotmelts can be ren on the carriers mentioned beside the Standardauftragsverfahren like direct coating from nozzles, over rollers and. A. also in the Transferverfahren up inertial, as they become bottom DE 43 24 748 C2 disclosed. The adhesive becomes first on an endless circumferential, antiadhesively equipped webbing applied and subsequent in one laminating station with need using printing and temperature the improvement mass anchorage on the carrier material of the practicing ore RA towards.

In principle also a job of the adhesive from organic solvents or as aqueous dispersion is possible; the economic and ecological advantages of the Hotmelt dosage form are appropriate however for the hand.

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Further the adhesive and the pigment layers can raster-punctiformly by means of

Screen printing (DE 42 37 252 C2), whereby the Klebstoffpünktchen can be also of various sizes and/or different distributed (EP 0,353,972 B1), by gravure (DE 43

08,649 C2) in Längs-und transverse direction continuous bars, by raster pressure or by flexographic printing applied become.

Both layers can preferably be present in Kalottenform by screen printing or be also in another pattern such as grating, strip, zigzag lines and for example also by gravure applied. Furthermore it can be for example also sprayed, which results in a more or less irregular order picture.

In a preferable embodiment these are ten applied in the form of polygeometrischen Kalot.

The calottes can exhibit different forms. Preferred ones are flattened hemispheres. Further also the imprint of other forms and patterns on the Trä is germaterial possible, as for example a print image in form alphanumeric indication combinations or pattern as grating, strip, the other Kumulate of the calottes and zigzag lines.

By the single, in particular three pigment layers an improved protection of the colorgiving component becomes achieved. By the concentration gradients can the envelope and thus resistance of a marking against outside influences remarkably improved become.

The multilayer laser transfer foil according to invention shows excellent own shanks, in particular much improves, when they exhibit the transfer foils, the leaving sitive pigments in an homogeneous distribution within the sticking mass layer to have.

A there made intensive laser beam pigment sticking mass interaction. It comes to a thermal load, which can lead up to a destruction of the film (melt opens).

Further the sticking mass can thereby in their temporary gluing characteristic (sticking mass rewinding) and in the transfer of the pigments into or on the component strong negative influenced become.

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The film according to invention does not point the negative effects to coatings and plastic plates (PP) due to the pigmented barrier layer to the verb living construction unit, but a durable label on the component.

Additional advantages arise as a result of smaller pigment employment opposite the homogeneous distribution of the pigment in the entire adhesive and from it resul animal-end smaller problems in the case of pigment dispersion and a small laser the jet pigment sticking mass interaction.

It becomes a very good inscription result achieved. It shows up besides over RA schend a small Schmauchbildung. The signatures shown direct after the label an easy broader however strong high-contrast label. After a polishing course the contrast a little diminishes, but the contours of the writing become somewhat sharper.

Also on rough surfaces it lets the film according to invention zen to excellent in set, so for example on ceramic(s) bases of fuses or general on glass.

Particularly as stamped label the advantages full come to supports, the label can on the component applied and be belasert. After the label it becomes abge pulled. The procedure is terminated.

The laser transfer foil according to invention can be dargeboten as continuous roll, this in form of an Archimedean spiral around mostly a Papphülse wound is, and as stamped label. The latter can exhibit any shape, jeweili the adapted excellent towards targeted application.

On the basis the subsequent described figs will the film according to invention in particularly favourable embodiments near explained, without wanting to limit thereby the invention unnecessary. Show fig 1 the setup of a film according to invention in form one

Label, whereby an additional second adhesive view aufge broke is,

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Fig 2 the procedure of the label of a component bottom whom dung of the film according to invention.

In fig 1 is the setup of a film according to invention in form of a label shown.

The film sits down from the carrier layer 1, which first adhesive view 2, which is full laminar the carrier material 1 applied, from the first pigment layer 3, which a glass river pigment, an absorber and a laser-sensitive pigment contains, which second pigment layer 4, which a glass river pigment, an absorber and a laser-sensitive ent pigment holds as well as the third pigment layer 5, which contains a glass river pigment, an absorber and a laser-sensitive pigment, together.

The difference between the single pigment layers 3.4, 5 consists of the fact that those Concentration of the laser-sensitive pigment of the pigment layer 3 to the pigment layer 5 increases.

The pigment layers 3.4, 5 are likewise full-laminar applied.

Additional one is a second adhesive view 6 applied. This adhesive layer 6 is only partial calottes applied single in form.

These serve the film on the under reason as supporting points and/or a positioning assistance.

The fig 2 the disclosed procedure of the label of a component 15 using the film according to invention. First the laser transfer foil, 15 applied at the best in form of a label, becomes on the component, whereby become achieved by the adhesive layer an adhesion and a fixation of the label. Subsequent one the made label by means of a laser, which by the red cylinder 10 indicated is.

In all layers 3.4 the absorber takes up the energy of the laser 10 and continues to lead this to the glass particles and the metal oxide (11). The glass particles coat finally after that melt opens the metal oxide (13), transfered on the component 15.

After terminating the inscription procedure the transfer foil remote becomes, on the component stays the desired label 12, which essentially consists of in zellen dots, which exist coated metallic oxide deposits again of with a glass layer.